



INTERNATIONAL CIVIL AVIATION ORGANISATION
AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP (APIRG)
METEOROLOGY SUB-GROUP TENTH MEETING (MET/SG/10)
(Dakar, Senegal, 29 June – 01 July 2011)

Agenda item 5: Provision of tropical cyclone and volcanic ash advisories for the AFI Region and of the corresponding SIGMET by MWOs

**CONSEQUENCES OF THE
 EYJAFJALLAJÖKULL ON VAAC'S METHODOLOGY**

(Presented by France)

SUMMARY

During April and May 2010 air traffic was impacted on a large scale by the long lasting eruption of the Eyjafjallajökull volcano. This paper briefly describes some consequences of this eruption, in terms of current and expected requirements to VAACs.

1. INTRODUCTION

1.1. The airspace management crisis due to the eruption of Eyjafjöll in April 2010 surprised the aviation community in spite of procedures already tested in EUR region regularly for several years organised by the ICAO VOLCEX/SG (VOLCANIC EXERCICES STEERING GROUP). These procedures have proved too conservative and not fully adapted for such a long lasting ash producing eruption in one of the busiest airspace in the world.

1.2. To unlock the situation, new rules were proposed in EUR region, which changed the working methods of VAACs (Volcanic Ash Advisory Centre) London (UK MetOffice) and Toulouse (MeteoFrance), the latter one responsible for ash clouds monitoring and forecasting in continental Europe, Africa and Middle East.

1.3. Lessons learnt from the Icelandic eruption have proved the need of a global and harmonized approach to manage such emergency situations

2. DISCUSSION

2.1 The § 3.4.8 of ICAO Doc 9691 *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* states 'Unfortunately, at present there are no agreed values of ash concentration which constitute a hazard to jet aircraft engines. ... In view of this, the recommended procedure in the case of volcanic ash is exactly the same as with low-level wind shear, regardless of ash concentration — AVOID AVOID AVOID.'

2.2 As a consequence of the long lasting production of volcanic ash up to FL400-450 at the beginning of the eruption and the unfavourable met conditions drifting ash towards western Europe, dispersion models run by the VAACs were describing large airspaces contaminated by volcanic ash. The strict application of this rule led to the cancellation of more than one hundred thousands flights due to the closure of a large part of the European airspace in April 2010.

2.3 To unlock the crisis, thresholds of concentration acceptable or hazardous for turbojet engines were given to the VAACs. New requirements came from the NAA (National Aviation Authorities) to be provided with concentrations maps based on these thresholds with a system of three coloured areas (cyan, grey, red) corresponding to LOW, MEDIUM and HIGH concentration prediction. An example of this map is given in Appendix A.

2.4 During the crisis, VAAC Toulouse run four times a day its dispersion model MOCAGE to share expertise with London VAAC, as well as to be in position to provide an immediate back up in case of an VAAC London outage. The model outputs were equally used to support strategic decisions from French Civil Aviation Authorities.

2.5 The methodology of VAAC was before this crisis mainly based on satellite detection and dispersion model was used in conjunction to the satellite imagery, which is qualitative by nature. The new requirement on quantitative concentration maps implies a need of improvements for observation and measurement as well as a better description of the source term used to initialize dispersion model.

2.6 To respond to this challenge, ICAO created last year the IVATF (International Volcanic Ash Task Force). Four sub groups have been tasked since July 2010 to work on four subjects:

2.6.1 AIRworthiness sub group will improve the knowledge about effects of volcanic ash on turbojet engines (concentration, duration of contamination etc).

2.6.2 ATM sub group will develop global and harmonized procedures from ATM in contingency situation due to volcanic ash on order to have consistent response from the different states..

2.6.3 IAVW sub group will take in charge the improvement of advisory information issued to aviation users by the VAACs, including possible new products based on concentrations, on a global basis, in close collaboration with the IAVWOPSG (International Airways Volcano Watch Operations Group).

2.6.4 SCience sub group will deal with all the science challenges related to new requirements from the dispersion model improvement to the observation and measurement need, and will coordinate with the other groups on a large number of issue.

2.7 The second meeting of IVATF in ICAO headquarters in July 2011, followed by the IAVWOPSG6 (Dakar, September 2011) will be of first importance to amend the current provisions of Annex3 at the light of the progress made since the Eyjafjallajökull eruption

3 ACTION BY THE GROUP

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3.1 The Group is invited to note the information in this paper

APPENDIX A

Example of concentration chart produced by VAAC Toulouse

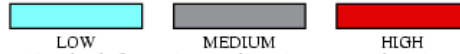


GRIMSVOTN Accident
Modelled Ash Concentration from SFC to FL200

24/05/2011 00h00 UTC

This is a guidance product, supplemental to the official VAAC Toulouse Volcanic Ash Advisory and Volcanic Ash Graphic products.

Issue time: YYYYMMDDHHMM



All concentrations are subject to a level of uncertainty relative to errors in the estimation of the eruption strength

